



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER OF PATENTS AND TRADEMARKS  
Washington, D.C. 20231  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/886,437	06/21/2001	Stephan Alan Cohen	YOR920000772US1	5757

7590

03/13/2003

ALVIN JOSEPH RIDDLES  
CANDLEWOOD ISLE  
BOX 34  
NEW FAIRFIELD, CT 06812

EXAMINER

KITOV, ZEEV

ART UNIT

PAPER NUMBER

2836

DATE MAILED: 03/13/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/886,437

Applicant(s)

COHEN ET AL.

Examiner

Zeev Kitov

Art Unit

2836

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 21 June 2001.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1 - 15 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1 - 15 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 21 June 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 4.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *Drawings*

1. New corrected drawings are required in this application because submitted drawings are informal and hard to understand. Applicant is advised to employ the services of a competent patent draftsman outside the Office, as the U.S. Patent and Trademark Office no longer prepares new drawings. The corrected drawings are required in reply to the Office action to avoid abandonment of the application. The requirement for corrected drawings will not be held in abeyance.

2. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference sign(s) not mentioned in the description: element 2 in Fig. 4 is not described in the Specification.

The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description: element 25 in Fig. 5 is not shown. A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

### *Objection*

3. Claims 1 and 9 are objected due to a following statement: "a nondestructive unlimited current". According to the Fig. 2 drawing, the raise of current is shown with some limited angle, different from  $90^{\circ}$ . Therefore, the device does not have impedance

Art Unit: 2836

equal zero, and the current is not unlimited. Additionally, the claim 9 recites " passing current at an unlimited second rate".

The same objection is applicable to Specification, page 4, lines 14 and 16, wherein an applicant describes the raise of the current as "unimpeded". Appropriate corrections are required.

Claim 14 is objected due to a following statement: "alloy being of thickness that permits voltage at the magnitude of said overvoltage to be passed". Since the claimed device is used for over-voltage protection, the over-voltage is not supposed to be passed. Appropriate corrections are required. For purpose of examination, the statement was interpreted a following way: "alloy being of thickness that permits voltage below the magnitude of said overvoltage to be passed".

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1, 5, 9 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over F. Zandman et al. textbook, Resistor Theory and Technology in a view of Harris Co. Application Note 9307. Regarding Claims 1 and 9, Zandman et al. disclose most of the elements of the claim, including a protection device from the effects of spike and surge over voltages (see Fig. 20, page 250) having a body of dielectric material (shown

Art Unit: 2836

between two electrodes in Fig. 20, page 250) with first and second parallel faces separated by a thickness dimension (thickness D in Fig. 20) and having conductive contact over each of the first and second faces (two electrodes in Fig. 20, page 249 - 250). Zandman et al. further disclose dielectric material having property that in the presence of an increasing field between the contacts there is increase in current flow at a first rate (Region I, Fig. 18, page 248, and text on page 247) and in the presence of a field beyond some predetermined value, there is a nondestructive non linear accelerated current flow (Region III, page 248, and text on page 247). As to a particular value of critical voltage equal 2Mv/cm, Zandman et al. provides a formula (1.15 on page 250) giving a critical voltage as a function of thickness of dielectric material. By changing the dielectric thickness, the device can be adjusted to any particular value of critical voltage. Zandman et al. further disclose the element having two electrodes. However, it does not disclose means connecting the conductive contacts (electrodes) to a node in the circuitry and to the reference voltage.

Harris Co. Application Note 9307 discloses such connections of the varistor element (see Fig. 13, 14 and 19), wherein the varistor shown as being connected between the protected input node and the reference (ground) node. Both references have the same problem solving area, namely providing the varistor for over-voltage protection. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have connected varistor of Zandman et al. in a way shown by Harris Co. Application Note 9307, because as well known in the art, for over-

voltage protection the device is to be connected between the protected node and the reference node, which is usually the ground.

As to a method claimed in Claim 5, the method is inherent in a structure of Claim 1, rejected accordingly.

Regarding Claim 10, Zandman et al. provides a formula (1.15 on page 250) giving a critical voltage as a function of thickness of dielectric material. By changing the varistor thickness, the device can be adjusted to any particular value of critical voltage, including 2Mv/cm.

5. Claims 2 – 4, 6 – 8 and 11 – 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zandman et al. textbook, the Harris Co. Application Note 9307 and further in a view of Pryor et al. (US 4,809,044). As was stated above, Zandman et al. textbook and the Harris Co. Application Note 9307 disclose all the elements of Claim 1. However regarding Claims 2 and 6, they do not disclose the dielectric material having a thickness in the sub 200 nanometer range.

Pryor et al. disclose thin film over-voltage protection devices with dielectric material having thickness of 100 nanometers. Table I in col. 9 provides a typical thickness data for a-carbon (Diamond-Like Amorphous Carbon Films) as 1000 angstroms, which are equal to 100 nanometers. All the references have the same problem solving area, namely providing the varistors for over-voltage protection. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used the Diamond-Like Amorphous Carbon Films dielectric

with thickness below 200 nanometers, because (a) according to Pryor et al. (col. 2, lines 25 – 54), this makes possible implementation of the varistors in the IC form, (b) it provides varistor having following advantages (col. 5, lines 10 – 24): capable of being scaled up to handle relatively large currents, having a highly efficient thermal design to allow for substantial dissipation of heat, produces minimal insertion losses when in use, and has minimal capacitance, is capable of extremely high speed operation, and presents minimum inductance.

Regarding Claims 3, 7 and 12, requiring the body of dielectric material being about 50 nanometers, according to Zandman et al. (see formula 1.15 on page 250), the critical (threshold or breakdown) voltage is a function of thickness of dielectric material. By changing the dielectric thickness from 100 to 50 nanometers, the device is being adjusted to twice lower value of critical voltage.

Regarding Claims 4, 8, 11, 13 and 15, Pryor et al. disclose the thin film over-voltage protection devices having Diamond-Like Amorphous Carbon Films as the dielectric material (col. 9, lines 5 – 13).

Regarding Claim 14, Pryor et al. disclose the method of fabricating an over-voltage protection device in an integrated circuit comprising of the steps of: providing a layer of amorphous alloy material having a thickness that permits voltage below the magnitude of the critical voltage to be passed (elements 36 and 40 in Fig. 1, col. 8, lines 58 – 68, col. 9, lines 1 – 28 – 35), and providing on both sides of the amorphous alloy layer a specific protection area contact connected to the nodes (elements 34 and 42 in

Fig. 1, col. 8, lines 34 – 40), and including providing high conductivity path to reference potential (element 34 in Fig. 1).

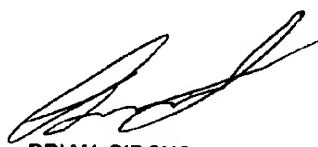
### ***Conclusion***

The prior art made of record not relied upon is considered pertinent to applicant's disclosure: US 4,159,259, US 6,136,055, US 5,153,554, US 5,166,859, US 3,859,568.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Zeev Kitov whose telephone number is (703) 305-0759. The examiner can normally be reached on 8:00 – 4:30. If attempts to reach examiner by telephone are unsuccessful, the examiner's supervisor, Brian Sircus can be reached on (703) 308-3119. The fax phone numbers for organization where this application or proceedings is assigned are (703) 308-7722 for regular communications and (703) 308-7724 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

Z.K.  
03/03/2003

  
BRIAN SIRCUS  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 2800